

# EUROPEAN PATENT OFFICE

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TITLE : GROUTING METHOD

ABSTRACT : PURPOSE: To prevent the deterioration of working environment due to the occurrence of much dust, by adding water, etc. to a mixture of lime with gypsum dihydrate, etc. in a specific proportion, mixing water with the resultant granulated hardening agent at a site of an execution work, mixing the resultant mixture with an aqueous solution of sodium silicate, and injecting the resultant grout into the ground.

CONSTITUTION: (A) 100pts.wt. mixture of (i) lime with (ii) a gypsum selected from gypsum dihydrate,  $\alpha$ -hemihydrate gypsum,  $\beta$ -hemihydrate gypsum and IItype anhydrous gypsum at (1:3)~(3:1) weight ratio between the components (i) and (ii) is mixed with preferably 5~30pts.wt. water and if necessary 0.05~ 5pts.wt. setting retarder, e.g. sodium citrate, and 0.25~5.0pts.wt. dispersing agent, e.g. sodium lignin sulfonate, and 20~200pts.wt. aggregate, e.g. colloidal cement, and then granulated to give a hardening agent mixture having preferably  $\leq 1$ mm particle diameter. Water is then added to the mixture to give (A) a solution, which is then mixed with (B) an aqueous solution of sodium citrate, preferably sodium citrate No.3. The resultant grout is then injected into the ground.

USE: Suitable for strengthening poor subsoil in closed places, e.g. tunnels, shields, etc.

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